



**RESEARCH**

# **Large-Loss Fires in the United States 2017**

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Stephen G. Badger

November 2018

## Introduction

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*Driven by a historically destructive California wildfire, 22 large-loss fires in 2017 resulted in 52 deaths, 233 injuries, and an estimated \$12.5 billion in direct property losses.*

NFPA reports annually on large-loss fires and explosions that occurred in the United States the previous year. Those fires are defined as events that result in property damage of at least \$10 million. There were 22 such fires in 2017, resulting in a total of over \$12.54 billion in direct property losses.

In order to compare losses over the past 10 years, we adjust losses for inflation to 2008 dollars. When adjusted for inflation, the number of fires in 2017 that would have been categorized as large-loss fires—that is, fires resulting in a loss of \$10 million in 2008 dollars—drops to 19, with an adjusted loss of slightly more than \$11 billion.

In 2017, 13 fires, seven more than the previous year, resulted in more than \$20 million each in property damage. These 13 fires resulted in a combined property loss of \$12.4 billion, or 99.1 percent of the total loss in large-loss fires.

The two largest-loss fires in 2017 were so-called “fire siege” wildfire incidents that occurred in California. A fire siege is defined as multiple, simultaneous, long-burning wildfires that cover large land areas and create serious challenges for firefighters.

The first fire siege was a wildfire in Northern California, referred to by Cal Fire as the 2017 October Fire Siege, that burned 245,000 acres (99,147 hectares) or 335 square miles (868 square kilometers), caused \$10 billion in damages, killed 44 people, destroyed an estimated 8,900 structures, and forced the evacuation of more than 100,000 people.

Leading up to the fire, AccuWeather reported a wetter than normal winter for 2016–2017 in California, which helped end a five-year drought. The precipitation contributed to ample vegetation growth, which subsequently become fuel for wildfires in the fall. In early October, 250 wildfires broke out. At the height of this wildfire activity, 21 fires burned out of control in six counties in Northern California. It has been reported that many of the fires were caused by downed power lines, falling power poles, and limbs falling on wires as a result of high winds. During this time, winds averaged 25–35 mph (40–56 kph), with gusts over 74 mph (112 kph). Diablo winds—hot, dry, offshore winds in north-central California—of hurricane force blew throughout the firestorm. Many of these large fires burned and merged with others to form fire complexes. One fire, the Tubbs Fire, became the most destructive wildfire in the state’s history, killing 22 people and destroying 5,643 structures.

With losses over \$10 billion, the 2017 October Fire Siege produced the highest damage total in the past 10 years and the second-highest in NFPA’s records of U.S. fires. The only fire with greater losses, including adjustments to 2017 dollars, was the 9/11 terrorist attack on the World Trade Center in New York.

The second-largest loss fire of 2017 was the California Fire Siege Two, which occurred in December. Weather conditions leading up to the event were the same as those preceding the October fire storm. Climate.gov wrote that a “perfect” combination of ingredients came together: extremely dry conditions, plenty of dry vegetation ready to ignite, and hot, dry Santa Ana winds. The winds were strongest during the early part of December, clocked at 70–75 mph (113–121

kph). The winds helped the fires grow to thousands of acres in size in a matter of a few hours. At least 29 wildfires were ignited across Southern California, with at least six becoming significant fires. At least 230,000 people were evacuated. By the time the fires were extinguished, they had burned 307,953 acres and destroyed 1,355 structures. One firefighter and one civilian were killed, and 12 firefighters and seven civilians were injured. Damage from the December fires was estimated at \$1.8 billion.

According to [Fire Loss in the United States During 2017](#), U.S. fire departments responded to an estimated 1,319,500 fires, which resulted in an estimated loss of \$23 billion. Many of these fires were small or resulted in little or no reported property damage. Although the 22 large-loss fires accounted for 0.002 percent of the estimated number of fires in 2017, they accounted for 54.5 percent of the total estimated dollar loss. In human terms, these 22 fires accounted for 52 deaths, with another 233 injured.

For the eighth time in the past 10 years, a wildland/urban interface (WUI) fire topped the list of the year's costliest large-loss fires in terms of property loss. In 2011, 2015, and 2017, WUI fires accounted for both the largest and second-largest fires in terms of estimated losses. In the past 10 years, there have been 29 wildland fires that accounted for more than \$10 million each in direct property losses—14 accounted for over \$100 million each, and three have accounted for more than \$1 billion. In human terms, these 29 fires have been responsible for 80 deaths, 499 injuries, and totaled \$17.7 billion in loss to property.

In the past 10 years, 26 fires have occurred that each resulted in a loss of more than \$100 million. Of these largest-loss fire events, 13 were WUI fires, 12 were structure fires, and one involved a U.S. Navy ship. These fires resulted in combined losses of more than \$19 billion.

In 2017, there were three (or 12 percent) fewer large-loss fires than in 2016, but an increase of more than \$11 billion (or 88 percent) in losses. Last year there were two (or 8 percent) fewer large-loss structure fires than in 2016, but the property loss associated with those fires was \$399 million (or 53 percent) higher. There was one less large-loss non-structure fire compared to 2016, but the loss was more than \$10.7 billion greater due to the large California wildfires of 2017.

## Where the Fires Occurred and How

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Of the 22 large-loss fires in 2017, 20 involved structures and resulted in a total property loss of \$747.7 million, or 6 percent of the combined losses for all large-loss fires. The other fires included the two California WUI fires that resulted in combined losses of \$11.8 billion, or 94 percent of the losses in all the large-loss fires. (See [Table 3](#) and [Figure 3](#).)

Of the 20 structure fires, eight involved properties under construction; all were apartment complexes and several were within weeks of completion. The combined loss for these eight fires was \$428.5 million.

Four fires occurred in manufacturing plants—the facilities included a saw mill, a wood products manufacturer, a paper mill, and a slaughterhouse—causing a combined loss of \$110.6 million.

Two fires occurred in apartment buildings, one with 569 units and the other with 60 units, with a combined loss of \$129.4 million. Fires at two storage properties—a food storage warehouse and a plastic products recycling warehouse—resulted in combined losses of \$31 million.

One fire each occurred in a high school (with \$14.1 million in losses), an automobile dealership (\$12 million), a country club (\$12 million), and a hospital (\$10 million).

In 16 of the 22 large-loss fires last year, the cause and origin of the fire were undetermined, unknown, or were not reported. In several cases, the destruction was so extensive that investigators could not make a definitive cause determination or could not rule out several possibilities. Other fires are still under investigation or causes have not yet been reported.

Cause was reported for six of the 22 fires, all of them structure fires. Two of the fires were incendiary: one in a 265-unit apartment building under construction, resulting in a loss of \$110 million, and another in a hospital waiting area, resulting in a \$10 million loss. Additionally, a fire caused by careless disposal of smoking materials at a country club resulted in a loss of \$12 million; a fire started by hot work at an apartment under construction caused a loss of \$12 million; a running generator ignited materials in an apartment building also under construction, resulting in \$45 million in damage; and a fire in a food warehouse, started by a truck that caught fire outside, caused \$21 million in damage.

Operating status was reported for 16 of the 20 structure fires. In eight cases, the facility was open, operating, or had workers on-site. Six were closed and the properties were unoccupied. At one fire, there was a security guard on duty, and at another there was a maintenance employee on-site. In four cases, the operating status of the property was not reported.

Ten of the structure fires broke out between 11 p.m. and 7 a.m. and had a total direct property loss of \$315.7 million.

In addition to the 20 structure fires, the two WUI fires in California had a combined total loss of almost \$12 billion.

## **Smoke Detection and Automatic Suppression Equipment**

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Information about automatic fire or smoke detection equipment was reported for 15 of the 20 large-loss structure fires. Of those 15 fires, 12 properties had smoke alarms present and three had no automatic detection equipment installed. Five of the 12 systems operated as designed; six systems did not operate, and in one case the operation was not known. Five of the six systems that did not operate were either not completely installed or had been shut off prior to the fire due to construction. No reason was given for one of the systems not operating.

Information about automatic suppression equipment was reported for 16 of the 20 structure fires. In those 16 fires, nine properties had suppression systems present and seven had no systems present. In six cases, the systems did not operate because the sprinkler systems were shut down prior to the fire or the systems were not yet complete due to construction. In one case, the system operated and kept the fire from spreading. The operation of systems in two of the fires was not reported.

Complete information on the presence of both detection and suppression equipment was reported for 15 of the 20 structure fires. Nine structures had both detection and suppression equipment, three had no detection, and three had neither system present.

## **What We Can Learn and Where We Get Our Data**

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Adhering to the fire protection principles reflected in NFPA's codes and standards is essential if we are to reduce the occurrence of large-loss fires and explosions in the U.S. Proper construction, proper use of equipment, and proper procedures in chemical processes, storage, and housekeeping will make fires less likely to occur and help limit fire spread should a fire occur.

Proper design, maintenance, and operation of fire protection systems and features can keep a fire that does occur from becoming a large-loss fire.

NFPA identifies potential large-loss incidents by reviewing national and local news media, as well as fire service publications. A clipping service reads all U.S. daily newspapers and notifies NFPA's Applied Research Division of major large-loss fires. NFPA's annual survey of the U.S. fire experience is an additional data source, although not the primary one. Web searches have proven useful in several cases where fire department and government reports have been released and published.

Once a fire has been identified, NFPA requests information about it from the fire department or jurisdictional agency. We also contact federal agencies that have participated in investigations, as well as state fire marshals' offices and military sources. The diversity and redundancy of these data sources enables NFPA to collect the most complete data available on large-loss fires. This report includes only fire incidents for which NFPA has official dollar-loss estimates; other fires with large losses may have occurred, but are not included here because no official information has been reported to NFPA.

NFPA would like to thank the U.S. fire service for its contributions of data, without which this report would not be possible. In some cases, the fire department, forestry officials, or government officials were unable to contribute complete details to NFPA because legal action is pending or ongoing, the incident was of a sensitive nature, or the size of the situation was overwhelming and reports had not yet been released. The author also wishes to thank Nancy Schwartz and the staff of NFPA's Research group for providing the support this study requires.

## **About the Author**

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Stephen G. Badger is a fire data assistant in NFPA's Applied Research Group and a retired firefighter from the Quincy, Massachusetts, Fire Department.

## **Acknowledgements**

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NFPA No. LLS10

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**Table 1.**  
**Large-Loss Fires that Caused \$10 million or more in Property Damage, 2008-2017**

Year	Number of Fires	Number of Fires Causing \$10 Million or More (in 2008 Dollars)	Direct Property Damage (in Millions)	
			Unadjusted	In 2008 Dollars
2008	35	35	\$2,322	\$2,322
2009	25	21	\$950	\$913
2010	17	12	\$652	\$594
2011	23	18	\$820	\$737
2012	26	19	\$1,463	\$1,306
2013	21	16	\$845	\$734
2014	26	23	\$714	\$622
2015	27	16	\$2,535	\$2,208
2016	25	19	\$1,474	\$1,259
2017	22	19	12,543	\$10,991

Note: Number of fires and unadjusted loss are based on data from studies that appeared in previous annual large-loss studies. Some of the information may differ from previously published material because material was updated after publication.

Note: Adjustment for inflation is based on the Consumer Price Index using 2008 as a base year. Note that adjustment for inflation not only reduces the total dollar loss for each year but also reduces the number of fires when adjusted losses large enough to qualify as large-loss fires.

Source: NFPA's Fire Incident Data Organization

**Table 2.**  
**Large-Loss Fires of \$20 Million or More in 2017**

Incident and Location	Dollar Loss (in Millions)
Wildfires, California	\$10,020.0
Wildfires, California	\$1,775.2
Building under construction (apartments), Massachusetts	\$110.0
Apartment building, Hawaii	\$107.4
Building under construction (apartments), Maryland	\$100.0
Building under construction (apartments), North Carolina	\$62.5
Building under construction (apartments), California	\$50.0
Paper plant explosion (no after fire), Florida	\$50.0
Building under construction (apartments), Massachusetts	\$45.0
Sawmill, Pennsylvania	\$35.6
Building under construction (apartments), New Jersey	\$34.0
Apartment building, Texas	\$22.1
Food storage warehouse, Maine	\$21.0
<b>Total Losses – 13 Incidents</b>	<b>\$12,432.8</b>

Sums may not equal totals due to rounding errors.  
Source: NFPA's Fire Incident Data Organization

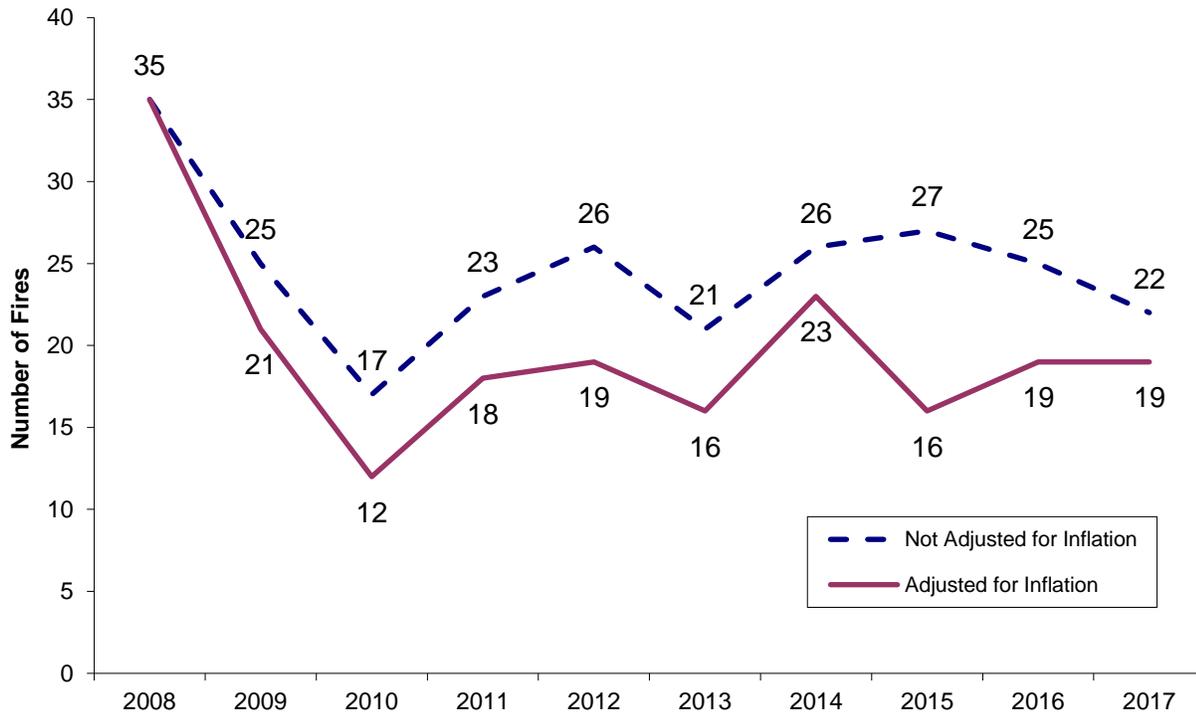
**Table 3.**  
**2017 Large-Loss Fires by Major Property Use**

Property Use	Number of Fires	Percent of Fires	Total Dollar Loss	Percent of Loss
Special Properties	8	36%	\$428,500,000	3.4%
Manufacturing	4	18%	\$110,600,000	0.9%
Wildfires	2	9%	\$11,795,140,816	94.0%
Residential	2	9%	\$129,445,611	1.0%
Storage	2	9%	\$31,000,000	0.2%
Sales	1	5%	\$12,000,000	0.1%
Educational	1	5%	\$14,128,000	0.1%
Public Assembly	1	5%	\$12,000,000	0.1%
Institutional	1	5%	\$10,000,000	0.1%
<b>Total</b>	<b>22</b>	<b>100%</b>	<b>\$12,542,814,427</b>	<b>100.0%</b>

Sums may not equal totals due to rounding errors.

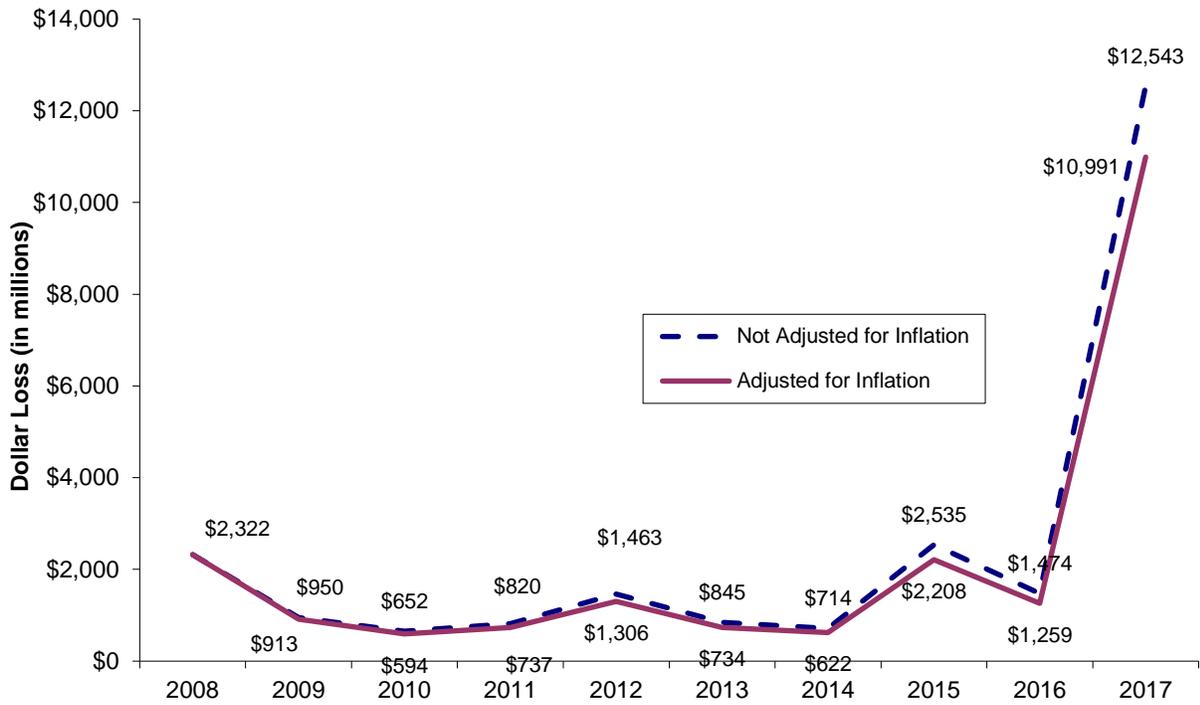
Source: NFPA's Fire Incident Data Organization (FIDO).

**Figure 1**  
**Large-Loss Fires, Unadjusted and Adjusted for Inflation (2008 - 2017)**



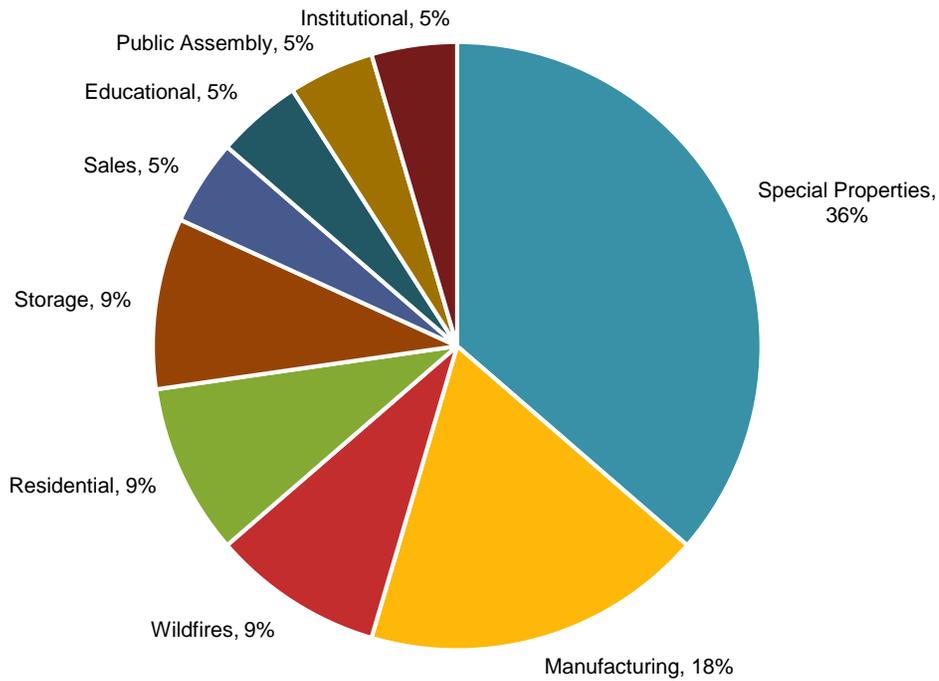
Source: NFPA's Fire Incident Data Organization (FIDO).

**Figure 2**  
**Direct Dollar Loss in Large-Loss Fires, Unadjusted and Adjusted**  
**(2008-2017)**



Source: NFPA's Fire Incident Data Organization (FIDO).

**Figure 3.**  
**Large-Loss Fires by Major Property Use**



Source: NFPA's Fire Incident Data Organization (FIDO).

## 2017 U.S. Large-Loss Fire Incidents by Occupancy Type

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### Special Properties

#### Massachusetts

##### Month, Time of Alarm, Dollar Loss

July, 3:47 a.m., \$110 million

##### Property Characteristics and Operating Status

This was a five-story, 125,000-square-foot (11,613-square-meter) apartment complex (265 units in five buildings) of unprotected wood-frame construction that was still under construction. No one was on-site at the time.

##### Fire Protection Systems

There were smoke alarms present, but they did not operate because they had not yet been activated. There was an automatic suppression system in place but it had not yet been activated.

##### Fire Development

The fire broke out on the second floor in one of the buildings and was determined to be an incendiary fire. Upon arrival, firefighters found two structures fully involved. Due in part to the lightweight construction, the fire spread rapidly throughout the five buildings. There was no additional information reported on the fire spread.

##### Contributing Factors and Other Details

Arriving firefighters went to a defensive operation due to heavy fire involvement of the buildings. Five buildings were involved at the fire's height.

#### Maryland

##### Month, Time of Alarm, Dollar Loss

April, 9:35 a.m., \$100 million

##### Property Characteristics and Operating Status

This was a six-story, 160,000-square-foot (14,864-square-meter) apartment building of unprotected wood-frame construction that was still under construction. There were workers present when the fire broke out. The structure covered a full city block.

##### Fire Protection Systems

There were smoke alarms and an automatic suppression system in place but they had not yet been activated.

##### Fire Development

The fire broke out in a fifth-floor apartment being used for trash storage. The cause was not determined. Workers attempted to extinguish the fire prior to the fire department's arrival. No further information was reported on the development or spread of the fire.

##### Contributing Factors and Other Details

It was not reported if the workers' attempts to extinguish the fire delayed notification of the fire department.

#### North Carolina

##### Month, Time of Alarm, Dollar Loss

March, 10:02 p.m., \$62.5 million

##### Property Characteristics and Operating Status

This was a six-story, 120,000-square-foot (11,148-square-meter), 242-unit unprotected wood-frame apartment building that was under construction. No one was on-site at the time.

##### Fire Protection Systems

There was no automatic detection or suppression equipment present.

##### Fire Development

The fire broke out on the second floor and involved wood structural members. The cause was undetermined and is still under investigation. No information was reported on the fire's spread.

#### **Contributing Factors and Other Details**

This building was part of a complex that was under construction.

### **California**

#### **Month, Time of Alarm, Dollar Loss**

May, 4:58 a.m., \$50 million

#### **Property Characteristics and Operating Status**

This was a six-story, 30,000-square-foot (2,787-square-meter), 105-unit unprotected wood frame apartment building under construction.

#### **Fire Protection Systems**

There was no automatic detection or suppression equipment present.

#### **Fire Development**

The fire began on the first floor. No information was reported on the spread of the fire. The cause is undetermined.

#### **Contributing Factors and Other Details**

The loss was reported as \$15 million to the structure and \$35 million to the contents. It was not reported what the contents were.

### **Massachusetts**

#### **Month, Time of Alarm, Dollar Loss**

June, 2:32 p.m., \$45 million

#### **Property Characteristics and Operating Status**

This was a six-story, 13,006-square-foot (1,208-square-meter), 83-unit apartment building of unprotected wood-frame construction that was still under construction. Workers were on-site.

#### **Fire Protection Systems**

There were smoke alarms present, but they did not operate because they had not yet been activated. There was an automatic suppression system in place but it had not yet been activated.

#### **Fire Development**

The fire broke out on the sixth floor when radiated heat from a generator vent pipe ignited wood structural members. The fire spread through void spaces.

#### **Contributing Factors and Other Details**

Arriving firefighters initiated an interior attack but went to a defensive operation due to heavy fire involvement. Firefighters reported that there was an hour-and-a-half delay from the time workers first smelled smoke to when the fire department was notified.

### **New Jersey**

#### **Month, Time of Alarm, Dollar Loss**

February, 1:30 a.m., \$34 million

#### **Property Characteristics and Operating Status**

This was a 200-unit apartment building under construction. No details on height or size were reported.

#### **Fire Protection Systems**

No information was reported. The fire is still under investigation.

#### **Fire Development**

No information reported. The fire is still under investigation.

#### **Contributing Factors and Other Details**

No information reported. The fire is still under investigation.

## Massachusetts

### Month, Time of Alarm, Dollar Loss

September, 2:38 a.m., \$15 million

### Property Characteristics and Operating Status

This was a four-story, 37,500-square-foot (3,484-square-meter), 50-unit apartment building of unprotected wood-frame construction that was still under construction. No one was on-site.

### Fire Protection Systems

There were smoke alarms and an automatic suppression system in place, but they had not yet been activated.

### Fire Development

A fire of undetermined cause broke out in a second-floor apartment. The fire burned up to the roof within voids, then burned across the roof and down into the fourth floor.

### Contributing Factors and Other Details

Arriving firefighters went to a defensive operation due to heavy fire involvement. Water supply was a problem for fighting this fire, as was the involvement of lightweight construction and a floor collapse.

## Indiana

### Month, Time of Alarm, Dollar Loss

May, 6:46 a.m., \$12 million

### Property Characteristics and Operating Status

This was a six-unit, three- and four-story apartment building of unprotected wood-frame construction that was still under construction. The floor area was not reported. Workers were on-site at the time.

### Fire Protection Systems

There were detectors present but not yet in operation due to construction. A sprinkler system had been installed but had not been activated.

### Fire Development

The fire broke out in the ceiling of a second-floor mechanical room. The fire was ignited during welding operations around a copper pipe when the insulation caught fire from direct flame from the torch. The welder unsuccessfully attempted to extinguish the fire with multiple fire extinguishers. He then cut a larger hole around the pipe and attempted to extinguish the fire. The worker believed the fire was out and did not contact the fire department, resulting in a 45-minute delay.

### Contributing Factors and Other Details

Firefighters attempted an interior attack but when they reached the second floor they found there had been a floor collapse. Firefighters were withdrawn to a defensive attack.

## Manufacturing

## Florida

### Month, Time of Alarm, Dollar Loss

January, 7:39 p.m., \$50 million

### Property Characteristics and Operating Status

This was a paper plant. No information was reported on the heights and floor area of the buildings other than that they were structures of various sizes and heights.

### Fire Protection Systems

No information was reported as the incident is still under investigation.

### Fire Development

A mixture of off-gases and air combined to create an explosive environment. It was not determined what ignition source caused an explosion. The incident is still under investigation.

#### **Contributing Factors and Other Details**

There was no after fire reported following the explosion. Upon arrival, fire companies tried to enter the damaged area but were delayed by a steam leak. Once they entered the structure, they were stopped again by the presence of hazardous chemicals and a large amount of debris.

### **Pennsylvania**

#### **Month, Time of Alarm, Dollar Loss**

March, 4 a.m., \$35.6 million

#### **Property Characteristics and Operating Status**

This saw mill for hardwood lumber was of unprotected wood-frame construction. The height and floor area were not reported. There was a security guard at the site at the time of the fire.

#### **Fire Protection Systems**

Neither automatic detection nor suppression equipment was present. Dry chemical extinguishers were available.

#### **Fire Development**

The fire began in wood or sawdust in the basement at the bottom of a flight of stairs. The cause is undetermined and still under investigation. No additional information was available.

#### **Contributing Factors and Other Details**

The security guard attempted to extinguish the fire using dry-chemical extinguishers for five minutes before calling the fire department. The loss was estimated at \$9 million to the structure and \$26.6 million to the contents, including hardwoods from around the world.

### **North Carolina**

#### **Month, Time of Alarm, Dollar Loss**

March, 2:48 a.m., \$15 million

#### **Property Characteristics and Operating Status**

This was a one-story, 150,000-square-foot (13,935-square-meter) chicken processing plant of unprotected noncombustible construction. The plant was operating at the time.

#### **Fire Protection Systems**

There was a smoke detection system present. Its coverage was not reported but the system did operate. There was no suppression equipment present.

#### **Fire Development**

The fire began in a machine room and involved natural gas. The exact cause is still undetermined and under investigation.

#### **Contributing Factors and Other Details**

When firefighters arrived, the fire had already burned through the roof. The loss was estimated at \$10 million to the structure and \$5 million to the contents.

### **Michigan**

#### **Month, Time of Alarm, Dollar Loss**

August, 6:30 p.m., \$10 million

#### **Property Characteristics and Operating Status**

This was a one-story, 12,000-square-foot (1,189-square-meter) wood-product manufacturing plant of unprotected noncombustible construction. The plant was closed for the night but one person was in the building.

#### **Fire Protection Systems**

There was no detection or automatic suppression equipment present.

## **Fire Development**

The fire was first discovered in the area of a wood lathe and involved wood or wood dust. The ignition source was not determined. No further information was reported on the spread of the fire.

## **Contributing Factors and Other Details**

One injury was reported. Arriving apparatus found a dry hydrant not working. Water was brought to the scene by 12 tanker trucks over the course of eight hours.

## **Wildland/Urban Interface**

### **California**

#### **Date, Time of Alarm, Dollar Loss**

October, 9 a.m., \$10 billion

#### **Setting**

Wildland/urban interface

#### **Climate**

Red flag warning in effect, with temperatures in the 90s F (30s C), humidity near 14 percent, very windy.

#### **Fire Origin and Path**

Various causes, many of which were electrical in nature, including wires and power poles that had been downed by high winds.

#### **Contributing Factors and Other Details**

Cal Fire refers to this as the “2017 October Fire Siege.” This incident encompassed 21 large fires that burned 245,000 acres (99,147 hectares), destroyed 8,887 structures, damaged 731 structures, killed 44 people, and injured 195 firefighters and civilians.

### **California**

#### **Date, Time of Alarm, Dollar Loss**

December, 9 a.m., \$1.8 billion

#### **Setting**

Wildland/urban interface

#### **Climate**

Climate.gov wrote that a “perfect” combination of ingredients came together, including extremely dry conditions and Santa Ana winds. The winds were the strongest during early December, clocked at 70–75 mph (113–121 kph).

#### **Fire Origin and Path**

Several different causes were found for the fires included in this event, including downed power lines, limbs on power lines, burning of debris, and an illegal cooking fire, along with other causes that were reported but that remain unknown.

#### **Contributing Factors and Other Details**

Santa Ana winds, as well as a lack of rain and dry vegetation, helped the fires grow to thousands of acres in a matter of a few hours. Firefighters had to contend with very difficult terrain to reach fires. One firefighter was killed during this fire, and seven civilians and 12 firefighters were injured. The fire burned 307,953 acres and destroyed 1,355 structures.

## Residential Properties

### Hawaii

#### Month, Time of Alarm, Dollar Loss

July, 2:17 p.m., \$107.3 million

#### Property Characteristics and Operating Status

This was a 36-story, 569-unit apartment building of unprotected ordinary construction that covered 20,800 square feet (1,932 square meters) and was occupied.

#### Fire Protection Systems

There was a complete-coverage smoke alarm system present that operated. There was no automatic suppression equipment present. There were standpipe connections on each floor that were used by the fire department.

#### Fire Development

The fire started in the living room of an apartment on the 26th floor. The cause was undetermined. The fire spread throughout the room. Once the fire caused an exterior window to break, the wind spread the fire into the hallway and into several additional units through louvered doors, and from the 26th floor to the 28th floor in seconds.

#### Contributing Factors and Other Details

No addition information was reported on the fire or smoke spread.

### Texas

#### Month, Time of Alarm, Dollar Loss

February, 8:30 p.m., \$22 million

#### Property Characteristics and Operating Status

This was a 60-unit occupied apartment building. No information was reported on the height, type of construction, or floor area.

#### Fire Protection Systems

No information was reported. The fire is still under investigation.

#### Fire Development

No information was reported. The fire is still under investigation.

#### Contributing Factors and Other Details

There was one fire death and one injury. No additional information was reported. The fire is still under investigation.

## Storage Properties

### Maine

#### Month, Time of Alarm, Dollar Loss

April, 8:15 p.m., \$21 million

#### Property Characteristics and Operating Status

This was a one-story, 143,875-square-foot (13,366-square-meter) food storage warehouse of unprotected ordinary construction. The warehouse was operating at the time of the fire.

#### Fire Protection Systems

There was a full coverage detection system of unknown type present that operated and alerted the fire department. There was a complete coverage dry-pipe sprinkler system present that operated, opening 15 sprinkler heads.

#### Fire Development

The fire began around an air conditioning unit on the roof of a trailer at the loading dock. The fire spread horizontally through the trailer, then to exposures and entered the structure at the loading dock. The sprinklers limited the fire spread in the warehouse.

#### **Contributing Factors and Other Details**

Smoke and heat spread throughout the warehouse, damaging food products and resulting in the large loss to contents.

### **West Virginia**

#### **Month, Time of Alarm, Dollar Loss**

October, 12:30 a.m., \$10 million

#### **Property Characteristics and Operating Status**

This warehouse stored plastic goods and recycled plastic. It was of multiple construction types, one and two stories in height, and covered 400,000 square feet (37,161 square meters). The building was closed for the night.

#### **Fire Protection Systems**

There were detectors present, but the type and coverage were not reported. The system did not operate; the reason was not reported. There were both wet- and dry-pipe sprinklers in the building. It was not clear if there were two suppression systems or a combination system, but the sprinklers did not operate because they had been shut off prior to the fire.

#### **Fire Development**

No information reported. The fire is under investigation.

#### **Contributing Factors and Other Details**

The structure was 25 percent involved with fire on arrival, and an exterior attack was initiated. Thirty-nine fire departments responded.

## **Education Properties**

### **Minnesota**

#### **Month, Time of Alarm, Dollar Loss**

August, 10:33 a.m., \$14.1 million

#### **Property Characteristics and Operating Status**

This was a three-story, 62,864-square-foot (5,840-square-meter) high school of unprotected ordinary construction. The school was unoccupied at the time of the fire. There was a small construction job underway at the site.

#### **Fire Protection Systems**

There was a complete coverage smoke detector system. Its operation was not reported. It was not determined if automatic suppression equipment was present.

#### **Fire Development**

A gas leak at a meter in the boiler room resulted in an explosion and fire. The ignition source was not reported.

#### **Contributing Factors and Other Details**

The estimated damage to the structure was \$7.1 million, and damage to contents was \$7 million.

## **PUBLIC ASSEMBLY PROPERTIES**

### **Missouri**

#### **Month, Time of Alarm, Dollar Loss**

February, 2:33 a.m., \$12 million

#### **Property Characteristics and Operating Status**

This was a two-story, 36,000-square-foot (3,356-square-meter) country club of unprotected wood-frame construction. The club was unoccupied at the time of the fire.

#### **Fire Protection Systems**

There were smoke detectors present and they operated, notifying an alarm company that in turn called the fire department. There was no automatic suppression system present.

#### **Fire Development**

A discarded cigarette ignited peat moss and dry vegetation in a large planter on an exterior deck. The fire extended to a deck and into the structure.

#### **Contributing Factors and Other Details**

The estimated damage to the structure was \$8 million with an additional \$4 million to the contents.

### **Store/Office Properties**

#### **Michigan**

##### **Month, Time of Alarm, Dollar Loss**

July, 7:30 p.m. \$12 million

##### **Property Characteristics and Operating Status**

Automobile sales. No additional information was reported.

##### **Fire Protection Systems**

No information was reported.

##### **Fire Development**

No information was reported.

##### **Contributing Factors and Other Details**

No information was reported.

### **Institutional Properties**

#### **Texas**

##### **Month, Time of Alarm, Dollar Loss**

January, 1:20 p.m., \$10 million

##### **Property Characteristics and Operating Status**

This was a 12-story hospital of unprotected ordinary construction that covered 34,700 square feet (3,224 square meters). The hospital was operating but construction was underway in the area of fire origin.

##### **Fire Protection Systems**

There was a full-coverage detection system present and it operated. There was a sprinkler system present; its type was not reported. It was not located in the area of origin and it was not clear if the system operated.

##### **Fire Development**

This fire was incendiary and was set in a second-floor waiting area. The fire was confined to the area of origin.

##### **Contributing Factors and Other Details**

Heavy black smoke spread throughout the building via stairways and elevator shafts. The fire is still under investigation.